ORIGINAL RESEARCH

Prostate volume and lower urinary tract symptoms

[1]Dr. Anil Huddedar, [2]Dr. Abhijeet Katkar, [3]Dr. Yogesh Jadhav, [4]Dr. Asit Chawdhary, [5]Dr. Atul Pawar

[1]Professor and HOD, [2,3]Assistant Professor, [4,5]Resident, Department of Urology, Krishna Institute of Medical Sciences, Deemed to be University, Karad, Maharashtra, India

Correspondence:
Dr. Anil Huddedar
Professor and HOD, Department of Urology, Krishna Institute of Medical Sciences, Deemed to be University, Karad, Maharashtra, India
Email: dranilhuddedar@gmail.com

ABSTRACT
Background: Benign prostatic hyperplasia (BPH) is a common progressive disease in the male aging population. The present study assessed relationship between prostate volume and lower urinary tract symptoms.
Materials & Methods: 80 male patients of lower urinary tract symptoms were selected and International Prostate Symptom Score (IPSS) was used for the evaluation of benign prostatic hyperplasia (BPH). All underwent ultrasonography of lower abdomen and the prostate volume of each patient was estimated.
Results: Age group age group 30-40 years had 8, 40-50 years had 11, 50-60 years had 26, 60-70 years had 22 and >70 years had 10 patients. The difference was significant (P< 0.05). Prostrate volume (in cc) 20-30 was seen among 15, 30-40 cc in 22, 40-50 cc in 16, 50-60 cc in 5, 60-70 cc in 12, 70-80 cc in 7 and 80-90 cc in 3 patients. The difference was significant (P< 0.05). IPSS revealed mild cases in 26, moderate in 34 and severe in 20. Prostrate volume 20-30 cc had 5, 10 and 0, 30-40 cc had 6, 11 and 5, 40-50 cc had 5, 5 and 6, 50-60 cc had 1, 3 and 3, 60-70 cc had 3, 1 and 8, 70-80 cc had 4, 2 and 0 and 80-90 cc had 2, 1 and 0 respectively.
Conclusion: Males with severe burden of lower urinary tract symptoms (LUTS) often have measurable decrements in overall health-related quality of life. IPSS total score and prostate volume showed a significant positive relationship.
Key words: Benign prostatic hyperplasia, ultrasound, LUTS

INTRODUCTION
Benign prostatic hyperplasia (BPH) is a common progressive disease in the male aging population.[1] Although aging and androgens are established risk factors, the cause of BPH remains uncertain.[2] Several mechanisms were hypothesized to be involved in the progression of BPH including hormonal or vascular alterations, inflammation, epithelial/stromal interactions, and luminal/epithelial cell interactions.[3]
Males with severe burden of lower urinary tract symptoms (LUTS) often have measurable decrements in overall health-related quality of life (QOL).[4] These patients seek medical advice for the bothersome LUTS, and the relief of symptoms and improvement in QOL are the most frequent indications for intervention.[5] Histologic analysis showed a decreased

apoptotic activity in glandular and basal epithelial cells of the prostate. Thus, with increasing age there is a tendency of increasing prostate volume (PV).[6]

Clinical diagnosis of BPH is made by the assessment of the International Prostate Symptom Score (IPSS), prostate size or volume and reduced urinary flow rate. The IPSS questionnaire is used worldwide to measure lower urinary tract symptoms (LUTS).[7] The present study assessed relationship between prostate volume and lower urinary tract symptoms.

MATERIALS & METHODS

The present study comprised of 80 male patients of lower urinary tract symptoms. All gave their written consent for the participation in the study.

Data such as name, age etc. was recorded. A thorough history and clinical examination was carried out. International Prostate Symptom Score (IPSS) was used for the evaluation of benign prostatic hyperplasia (BPH). It comprises of questionnaire and each question is assigned points from 0 (Not at all) to 5 (Almost always). Total score ranges from 0-35. A total score was categorized as mild (scores 7 or less), moderate (scores 8-19), and severe (scores 20-35). All underwent ultrasonography of lower abdomen and the prostate volume of each patient was estimated. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Age group wise distribution of patients

| Groups (years)	Number	P value
30-40	8	0.05
40-50	14	
50-60	26	
60-70	22	
>70	10	

Table I shows that age group 30-40 years had 8, 40-50 years had 11, 50-60 years had 26, 60-70 years had 22 and >70 years had 10 patients. The difference was significant (P< 0.05).

Table II Distribution based on prostrate volume

Prostrate volume (in cc)	Number	P value
20-30	15	0.01
30-40	22	
40-50	16	
50-60	5	
60-70	12	
70-80	7	
80-90	3	

Table II, graph I shows that prostrate volume (in cc) 20-30 was seen among 15, 30-40 cc in 22, 40-50 cc in 16, 50-60 cc in 5, 60-70 cc in 12, 70-80 cc in 7 and 80-90 cc in 3 patients. The difference was significant (P< 0.05).

Graph I Distribution based on prostrate volume
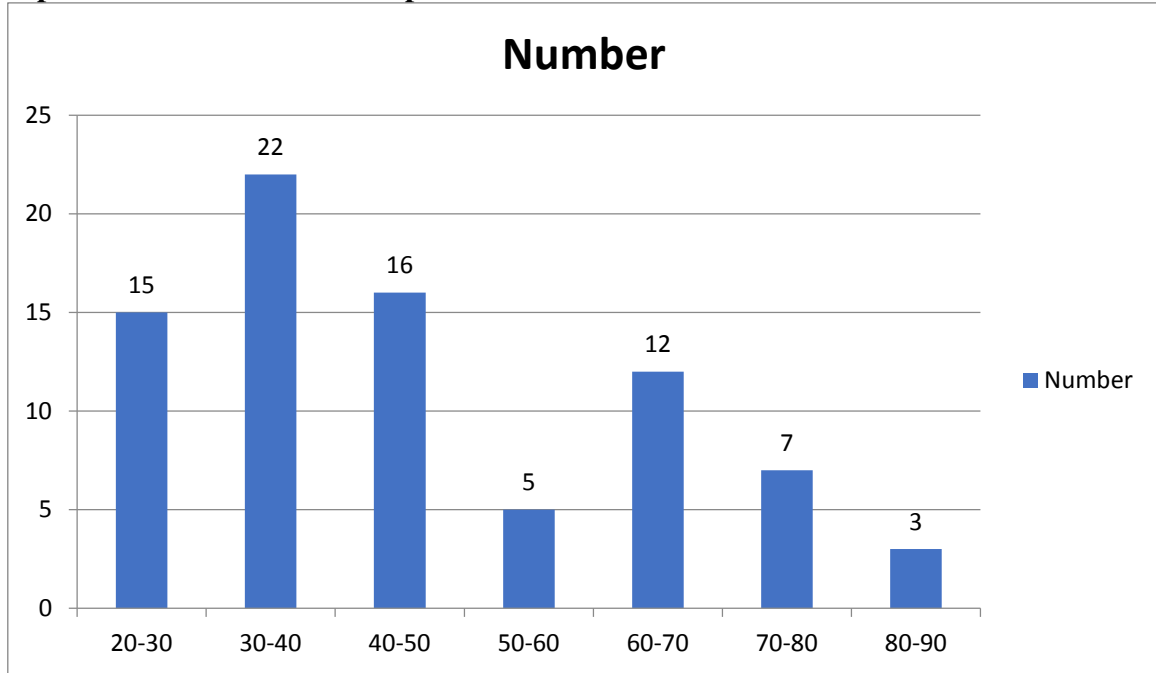
Table II IPSS severity in relation to prostrate volume

Prostrate volume (in cc)	Mild (26)	Moderate (34)	Severe (20)
20-30	5	10	0
30-40	6	11	5
40-50	5	5	6
50-60	1	3	1
60-70	3	1	8
70-80	4	2	0
80-90	2	1	0

Table III, graph II shows that IPSS revealed mild cases in 26, moderate in 34 and severe in 20. Prostrate volume 20-30 cc had 5, 10 and 0, 30-40 cc had 6, 11 and 5, 40-50 cc had 5, 5 and 6, 50-60 cc had 1, 3 and 3, 60-70 cc had 3, 1 and 8, 70-80 cc had 4, 2 and 0 and 80-90 cc had 2, 1 and 0 respectively.

Graph I IPSS severity in relation to prostrate volume
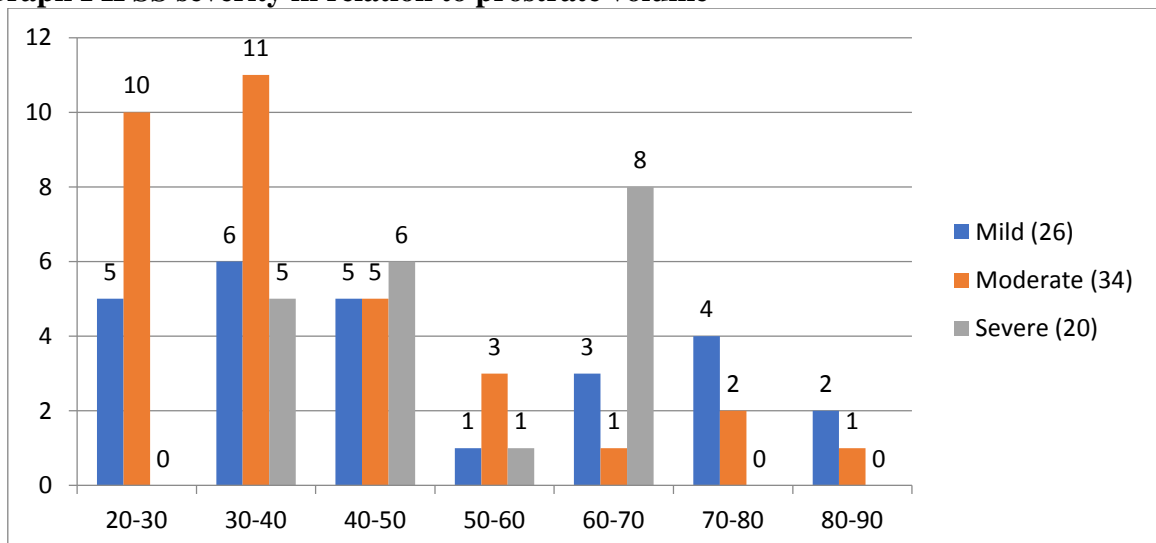
DISCUSSION

Benign prostatic hyperplasia (BPH)-related LUTS are common among older men, the incidence and prevalence of BPH and LUTS are increasing rapidly, they are associated with serious medical morbidities, an increased risk of falls, depression, diminished health-related quality of life (QOL), and billions of dollars in annual health care costs.[8,9]

Ultrasound of the prostate is the investigation that enables us to visualize the prostate gland directly and is one of the commonest diagnostic modalities performed in patients presenting with LUTS.[10] It can be done using the trans-abdominal approach as well as trans-rectal approach. There is a controversy on the relationship between IPSS score and the prostate volume in the literature.[11,12] The present study assessed relationship between prostate volume and lower urinary tract symptoms.

We found that age group 30-40 years had 8, 40-50 years had 11, 50-60 years had 26, 60-70 years had 22 and >70 years had 10 patients. Putra et al[13] investigated the relationship between age, prostate specific antigen (PSA), and prostate volume (PV) in Indonesian men with histologically proven benign prostatic hyperplasia. In all, 1638 patients were enrolled in our study. There was a statistically significant difference in PSA and PV ($P < 0.0001$) between age groups. Overall correlation between age, PSA, and PV were age and PV; age and PSA; PSA and PV. Subgroup analysis in terms of indwelling catheter use versus without age 66.09 ± 8 years versus 65.38 ± 7.66 years (; PSA 4.93 ± 2.62 ng/mL versus 4.68 ± 2.82 ng/mL; PV 47.58 ± 21.33 mL versus 41.43 ± 20.55 mL ($P < 0.0001$). Correlation between age, PSA, and PV in patients were similar in patients with and without indwelling catheter.

We found that prostrate volume (in cc) 20-30 was seen among 15, 30-40 cc in 22, 40-50 cc in 16, 50-60 cc in 5, 60-70 cc in 12, 70-80 cc in 7 and 80-90 cc in 3 patients. Teh et al[14] revealed a significant and good correlation between LUTS and patients' QOL, which indicates a clinical relevance. Patients' urinary symptoms were reflected on their QOL where most of them where unpleased or dissatisfied. The results of multiple regressions reported that frequent urination and incomplete emptying were the most significant factors that have the heaviest impact on patients' QOL, other factors like prostate volume and individual symptoms, except straining have a significant but less influential role.

We observed that IPSS revealed mild cases in 26, moderate in 34 and severe in 20. Prostrate volume 20-30 cc had 5, 10 and 0, 30-40 cc had 6, 11 and 5, 40-50 cc had 5, 5 and 6, 50-60 cc had 1, 3 and 3, 60-70 cc had 3, 1 and 8, 70-80 cc had 4, 2 and 0 and 80-90 cc had 2, 1 and 0 respectively. Ranjan et al[15]evaluated the relationship between IPSS and prostate volume in patients with LUTS. There is a significant relationship between IPSS and prostate volume measured through transabdominal ultrasonography. The Total IPSS increases with the prostate volume, as a significant positive relationship between IPSS total score and prostate volume was recorded.

The shortcoming of the study is small sample size.

CONCLUSION

Authors found that males with severe burden of lower urinary tract symptoms (LUTS) often have measurable decrements in overall health-related quality of life. IPSS total score and prostate volume showed a significant positive relationship.

REFERENCES

1. Chapple C, Herschorn S, Abrams P, Sun F, Brodsky M, Guan Z. Tolterodine treatment improves storage symptoms suggestive of overactive bladder in men treated with alpha-blockers. Eur Urol 2009;56:534-41.
2. Moore KN, Valiquette L, Chetner MP, Byrniak S, Herbison GP. Return to continence after radical retropubic prostatectomy: A randomized trial of verbal and written

instructions versus therapist-directed pelvic floor muscle therapy. Urology 2008;72:1280-6.

3. Huh JS, Kim YJ, Kim SD. Prevalence of Benign Prostatic Hyperplasia on Jeju Island: Analysis from a Cross-sectional Community-based Survey. World J Mens Health 2012;30:131-7.

4. Tsukamoto T, Kumamoto Y, Masumori N, Miyake H, Rhodes T, Girman CJ, et al. Prevalence of prostatism in Japanese men in a community-based study with comparison to a similar American study. J Urol 1995;154:391-5.

5. Andersson SO, Rashidkhani B, Karlberg L, Wolk A, Johansson JE. Prevalence of lower urinary tract symptoms in men aged 45-79 years: A population-based study of 40 000 Swedishmen. BJU Int 2004;94:327-31.

6. Chuang FP, Lee SS, Wu ST, Yu DS, Chen HI, Chang SY, et al. Change in International Prostate Symptom Score after transurethral prostatectomy in Taiwanese men with benign prostate hyperplasia: Use of these changes to predict the outcome. Arch Androl 2003;49:129-37.

7. Barry MJ, Fowler FJ Jr, O'Leary MP, Bruskewitz RC, Holtgrewe HL, Mebust WK, et al. The American Urological Association symptom index for benign prostatic hyperplasia. The Measurement Committee of the American Urological Association. J Urol 1992;148:1549-57.

8. Chong C, Fong L, Lai R, Koh YT, Lau WK, Hartman M, et al. The prevalence of lower urinary tract symptoms and treatment-seeking behaviour in males over 40 years in Singapore: A community-based study. Prostate Cancer Prostatic Dis 2012;15:273-7.

9. Lee E, YooKY, Kim Y, Shin Y, Lee C. Prevalence of lower urinary tract symptoms in Korean men in a community-based study. Eur Urol 1998;33:17-21.

10. Mostafa A Arafa, Karim Farhat, Saad Aqdas, Mohamed Al-Atawi, Danny M Rabah. Assessment of lower urinary tract symptoms in Saudi men using the International Prostate Symptoms Score. Urol Ann. 2015; 7(2):221-226.

11. Vesely S, Knutson T, Damber JEDicuio M, Dahlstrand C. Relationship between age, prostate volume, prostate-specific antigen, symptom score and uroflowmetry in men with lower urinary tract symptoms. Scand J Urol Nephrol. 2003; 37(4):3228.

12. Arafa MA, Farhat K, Aqdas S, Al-Atawi M, Rabah DM. Assessment of lower urinary tract symptoms in Saudi men using the International Prostate Symptoms Score. Urol Ann 2015;7:221-5.

13. Putra IB, Hamid AR, Mochtar CA, Umbas R. Relationship of age, prostate-specific antigen, and prostate volume in Indonesian men with benign prostatic hyperplasia. Prostate international. 2016 Jun 1;4(2):43-8.

14. Teh GC, Sahabudin RM, Lim TC, Chong WL, Woo S, Mohan M, et al. Prevalence of symptomatic BPE among Malaysian men aged 50 and above attending screening during prostate health awareness campaign. Med J Malaysia. 2001;56:186–95.

15. Ranjan et al. Comparative Evaluation of Relationship Between Prostate Volume and Lower Urinary Tract Symptoms. International Journal of Health and Clinical Research, 2021;4(1):72-74.